Recovery Outline For
Florida Bonneted Bat (*Eumops floridanus*)

October 2018

Photo: Dustin Smith

I. INTRODUCTION

This document outlines a preliminary course of action for the recovery of the Florida bonneted bat until a comprehensive recovery plan for the species is approved. The Florida bonneted bat is the largest bat in Florida and possesses characteristics more similar to tropical than temperate bats (Owre 1978; Belwood 1992; Timm and Genoways 2004; Florida Bat Conservancy 2005; McDonough et al. 2008). Florida bonneted bats have a unique physiology for swift, long-distance flight (Ober et al. 2017), and a distinctive echolocation call that is a lower frequency that other bat species in Florida (Marks and Marks 2012). At present, few active, natural roost sites are known, and only limited information on historical sites is available. The Florida bonneted bat was listed as an endangered species on October 2, 2013 (78 FR 61004). The primary threats to this bat include habitat destruction, modification and fragmentation, impacts associated with human development (e.g., bat exclusion on facilities, disturbance), disease, small population size, restricted range, and its resulting vulnerability to natural or human induced catastrophic events.

Listing and Contact Information:

Listing Classification:	Endangered range-wide
Effective Listing Date:	November 1, 2013
Lead Agency, Region:	U.S. Fish and Wildlife Service, Southeast Region
Lead Field Office:	South Florida Ecological Services Field Office
Contact Biologist:	Sandra Sneckenberger, 772-562-3909, Sandra_Sneckenberger@fws.gov

II. RECOVERY STATUS ASSESSMENT

A. Biology, Life History, Habitat, and Threats Assessment

[Note: For a description of this species' biology and an assessment of the listing factors as they relate to this animal, please see the final listing rule (78 FR 61004).]

The Florida bonneted bat is free-tailed bat; a member of the Family Molossidae. Like other molossids, the Florida bonneted bat is a large bat, capable of strong, fast flight. This is a highly social species, known to roost singly or in groups of over 50 individuals in pine and palm trees. This species breeds year-round, with peak activity occurring in April, however, it has low fecundity, with an average litter size of one pup (Florida Bat Conservancy 2005; Timm and Arroyo-Cabrales 2008). The Florida bonneted bat also has a fairly extensive breeding season during summer months (Timm and Genoways 2004). Based upon the work of Wilkinson and South (2002), Gore et al. (2010) inferred a lifespan of 10 to 20 years, with an average generation time of 5 to 10 years. Active year-round, the species is likely dependent upon a constant and sufficient food supply, consisting of insects, to maintain its generally high metabolism.

Based upon the results of numerous surveys conducted across southern Florida since 2003, this species appears to occur predominately in central, southwest, and extreme south (mainland) Florida, with the core range primarily consisting of habitat within Polk, Charlotte, Lee, Collier, Monroe (mainland), and Miami-Dade Counties. Recent data also indicate use of portions of Highlands, Okeechobee, Glades, Palm Beach, and Broward Counties and possible use of areas within Osceola, Sarasota, and De Soto Counties (unpublished data). The Florida bonneted bat uses forests, wetlands, open water, and other natural habitats, and has been recorded in residential and urban areas. Habitat loss, degradation, and modification from human population growth and associated development and agriculture have impacted the Florida bonneted bat and are expected to further curtail its limited range. Wildlife/human conflicts also threaten this species' persistence where there may be interactions (e.g., houses, roofs, culverts, bridges, utility equipment).

Aspects of the Florida bonneted bat's life history and ecology (e.g., slow reproduction, low fecundity, high-altitude aerial-hawking, foraging, roosting habits) make it especially vulnerable to current threats. These characteristics combined with demographic factors such as small population size, restricted range, few colonies, and relative isolation can slow population recovery. Climate change, pesticide use, and environmental stochasticity may also contribute to the Florida bonneted bat's imperilment.

B. Conservation Actions

The Florida bonneted bat was first recognized as a candidate species in 1991 (56 FR 58804). It was removed from the candidate list from 1996 to 2009 because the taxon was believed to more abundant or widespread. In 2009 (74 FR 57804), the Service included the Florida bonneted bat again as a candidate for listing under the Act. We determined that listing was warranted, but was precluded. Throughout this timeframe the Service has worked closely with scientific experts, land managers, and stakeholders to implement actions that will help ensure survival and long-term recovery of this unique animal. We listed the Florida bonneted bat as an endangered specices under the ESA in October 2013. This species was listed as endangered in the State of Florida (as the Florida mastiff bat) and as such receives protection under 68A-27, Florida Administrative Code (68A-27.0011 and 68A-27-003).

To date, collaborative conservation efforts have focused largely on: 1) conducting acoustic surveys within the species' historic range to better understand movements, threats, and delineate range; 2)

locating natural roosts and identifying factors influencing roost selection; 3) evaluating impacts to individuals living in urban areas; 4) using various techniques to accurately and safely monitor extant populations; and 5) increasing public awareness of this endangered species.

III. PRELIMINARY RECOVERY STRATEGY

A. Recovery Priority Number with Rationale

The Florida bonneted bat is assigned a recovery priority of 2C, which indicates the species faces a high degree of threat, has a high recovery potential, and may be in conflict with construction or other development projects or other forms of economic activity. Recovery potential is considered high for the Florida bonneted bat because of the species' potential for population growth if threats are eliminated (due to increased individuals found since listing and knowledge of other similar bats). Despite its restricted range and significant threats from habitat loss, human conflict, and climate change, this species' status can be appreciably improved through public education and outreach, changes to habitat management within protected areas, as well as the regulatory framework in place for all endangered species. Furthermore, the Florida bonneted bat is a species that receives considerable attention and support from researchers, conservationists, the media, and the public.

B. Recovery Strategy

The Florida bonneted bat's recovery strategy will initially focus on working with partners to understand the life history, range, resource needs, and population dynamics of this species. Second to these items will be an assessment of threats to the Florida bonneted bat, to determine their scope and severity, and identify possible means to minimize these threats. Survival of Florida bonneted bats also depends on protecting the species' occupied and suitable habitat from further degradation and fragmentation; and restoring potentially suitable habitat within its historical range. Increasing public awareness of this species will also be prominent in the recovery strategy, particularly as many threats involve conflicts with humans.

C. Initial Action Plan

Anticipated Recovery Actions in relation to our recovery strategy described above:

- Determine the distribution and status of the Florida bonneted bat;
- Protect and enhance known existing populations through regulatory mechanisms, education, and outreach;
- Minimize disturbance or mortality to the Florida bonneted bat through communication to utility and construction workers, nuisance animal companies, and the public;
- Continue to collaborate with state and federal agencies, other institutions and organizations to conduct research on the ecology and life history of the Florida bonneted bat, including foraging and roosting habitat associations, food habits, predators, parasites and disease, and the potential effects of pesticides;

- Develop standard methods to monitor the status of the Florida bonneted bat that allow for spatial and temporal comparisons;
- Develop a mechanism for sharing information (*i.e.,* GIS data, unofficial reports, mist netting data);
- Protect and manage Florida bonneted bat habitat through land acquisition and conservation easements, and by developing management plans with partners; and
- Examine ecological processes in Florida bonneted bat habitat including fire, hydrology, and other factors that increase the likelihood of supporting foraging and roosting.

IV. PREPLANNING PROCESS

A. Planning Approach

In conjunction with the Recovery Plan, a Species Status Assessment (SSA; https://www.fws.gov/endangered/improving_ESA/ssa.html) will be prepared for the Florida bonneted bat. An SSA begins with a compilation of the best available information on the species (taxonomy, life history, and habitat) and its ecological needs at the individual, population, and/or species levels based on how environmental factors are understood to act on the species and its habitat. Next, a SSA describes the current condition of the species' habitat and demographics and the probable explanations for past and ongoing changes in abundance and distribution within the species' ecological settings (*i.e.*, areas representative of geographic, genetic, or life history variation across the range of the species). Lastly, a SSA forecasts the species' response to probable future scenarios of environmental conditions and conservation efforts. Overall, a SSA uses the conservation biology principles of resiliency, redundancy, and representation (collectively known as the "3Rs") as a lens to evaluate the current and future condition of the species. As a result, the SSA characterizes a species' ability to sustain populations in the wild over time based on the best scientific understanding of current and future abundance and distribution within the species' ecological settings. A SSA is in essence a biological risk assessment to aid decision makers who must use the best available scientific information to make policy decisions.

The Recovery Plan will include objective and measurable criteria for the Florida bonneted bat, which, when met, will ensure the conservation of the species. Recovery criteria will address all meaningful threats to the Florida bonneted bat, as well as estimate the time and the cost to achieve recovery. The Florida bonneted bat SSA and Recovery Plan will be coordinated by the South Florida Ecological Services Field Office as the lead field office. The draft Recovery Plan should be finalized and sent to the Regional Office for review in 2019, with the final Recovery Plan finalized and sent to the Regional Office for review by 2020. These timelines may be affected by available resources and regional priorities.

B. Stakeholder Comment

During the recovery planning process, input, comments and review will be sought from multiple stakeholders in Florida where this bat occurs. These will include State and Federal agencies, industrial and agricultural groups, research universities, conservation organizations, and private landowners. We

will also be working very closely with other biologists and land managers to advance our knowledge and expertise with this species.

Approve: _____ Date: 1/30/2019
Assistant Regional Director, Region 4